Function oriented guidance as a form of neuropsychological rehabilitation for memory disturbed patients

Chapter 9

Function Oriented Guidance as a Form of Neuropsychological Rehabilitation for Memory Disturbed Patients

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Abstract

A program called Function Oriented Guidance is one of the interventions that is practiced for memory disturbed patients in the Maastricht Memory Clinic (the Netherlands). It is a short systematic program, based on four premises. It is holistic in nature, which implies that attention is not only given to memory and other cognitive deficits, but also to adapting and coping abilities, especially in the situation at home. This fairly new approach is described in the present paper. The premises and the program, which consists of five sessions, will be outlined. So far, 10 single-case studies have been carried out. All patients had memory complaints, but were different in terms of the nature of the memory disorder (e.g., problems with retrieving material from memory, with memory consolidation, with working memory span, with the efficiency of memory search processes). The preliminary results are indicative of a beneficial effect, in that patients with fairly mild cognitive deficits exhibit improved coping. This effect is based upon knowledge on "how memory works" and on (remaining) cognitive abilities. Conclusions and implications for the future will be described.

Neuropsychologists traditionally addressed themselves to the assessment of the psychological consequences of structural brain damage. In this way, they contributed to the discrimination between the "brain-damaged" ("organicity" or "encephalopathy") and the "functional" category and to medical diagnosis and classification. In the seventies, neuropsychologists started to describe functional, behavioral and cognitive abilities in terms of (cognitive) strengths and weaknesses (Lezak, 1983; Jolles, 1985) and to understand the nature and extent of the deficits in terms of brain-behavior relationships (Luria, 1966, 1973). This trend now extends into the area of

rehabilitation. A rather new topic is the translation of neuropsychological knowledge into practical advice for rehabilitation and (psycho) therapeutic interventions.

Rehabilitation has been traditionally given to patients with neurological disorders such as traumatic head injury and stroke. The intervention has been mostly a type of focused intervention such as the selective training of language, praxis, attention, memory or orientation (Powell, 1981; Grimm and Bleiberg, 1986; Wilson, 1987; Meier, Benton & Diller, 1987). The rehabilitation of higher cognitive functions such as planning, problem solving, etc., has received considerably less attention (Luria, Naydin, Tsvetkova & Vinarskaya 1969; Craine, 1982; Goldstein & Levin, 1987). This is probably due to the fact that, until recently, little was known about the relationship between cognitive deficits and the underlying cerebral substrate (an exception being language disturbances following lesions in the left cerebral hemisphere (Diamond, 1980)). Interest in the relationship between the higher cognitive functions and the brain has been stimulated particularly by the neuropsychologist Luria (1966, 1973) and by behavioral neurologists such as Geschwind (1980), Hecaen and Ajuriaguerra (1960, 1964) and others (Walsh, 1978; Flor-Henry, 1979; Fuster, 1980; Heilman & Valenstein, 1985; Kolb & Whishaw, 1985).

In recent years there has been growing literature that reflects the attention currently paid to developing active therapeutic strategies for the remediation of cognitively brain-injured humans (Ben-Yishay, 1981; Diller & Gordon, 1981a,b; Trexler, 1982). Also, effort is put into developing, applying and testing the practical therapeutic implications of neuropsychological knowledge and in combining psychotherapeutic techniques with neuropsychological principles (Miller, 1980, 1984). In reviewing the literature it becomes apparent that little systematic knowledge is gathered about the interaction between primary, cognitive and behavioral dysfunctions and the secondary, coping and adapting mechanisms after brain injury or brain dysfunction (Minderhound & Zomeren van, 1984). This is important because of the distinction that exists between emotional disturbances that are directly based upon the brain dysfunction and secondary emotional reactions (Heilman, Bowers & Valenstein, 1983; Miller, 1982; Stuss & Benson, 1984). Furthermore, little attention is given to neuropsychological intervention programs for subjects other than neurological patients. This is especially true for psychiatric patients with cognitive deficits (Diamant & Huysman, 1982). Finally, neuropsychological intervention is rarely directed at the situation at home or to people with relatively mild cognitive problems.

The present paper explores the possibilities of a neuropsychological rehabilitation program for those subjects who have up till now received

comparatively little attention: persons with mild cognitive deficits living at home (Reyersen van Buuren, Verhey & Jolles, 1987). A recently developed neuropsychological intervention program is presented. The program aims at training patients and their significant other(s) to cope more efficiently with everyday cognitive deficits. Systematic information about the disturbance is given, as well as information about memory and memory related factors. In addition, practical advice and strategies to aid memory function are offered. The program is not directed at the (re)training of cognitive functions per se. This paper describes the clinical setting, the population, the underlying paradigm, the conceptual framework and the problems of (semi)quantification and systematic evaluation of the effects.

A Model for Neuropsychological Intervention

Setting

The program is carried out in the Maastricht Memory Clinic (the Netherlands). The Memory Clinic provides a multi-disciplinary service for people with cognitive complaints and/or deficits (Verhey, Reyersen van Buuren & Jolles, 1987). The Clinic has three main purposes: first, to contribute to the neuropsychological and the medical diagnosis. Neuropsychiatric and neuropsychological investigation is carried out in a systematic and protocollized way. Diagnoses are based on DSM III criteria and (for the possibly demented patients) on the criteria of the NINCDS-ADRDA work group (McKhann, Drachman, Folstein, Katzman, Price & Stadlan, 1984). A second aim is the development and evaluation of experimental care and treatment programs for cognitively disturbed patients. In the third place, research is carried out which is directed at an early diagnosis of demential syndromes and to the risk factors for age-associated decline of cognitive functions.

The patient population

The patients come from different settings: general practioners, psychiatric and neurologic departments and ambulatory therapeutic centres. All patients share the complaint(s) about memory and other cognitive functions. The nature of the cognitive complaints and deficits sometimes suggests the involvement of structural brain damage or cerebral dysfunctions (Lishman, 1987). There is no age-restriction, but the majority of the population is between 40-70 years of age (average age 50.9). The nature of the patient population regarding diagnosis is summarized in Table 1.

Table 1
Patient Population of the Maastricht Memory Clinic

Main diagnosis	Patients (n=100)	%
No diagnosis	6	6
Psychiatric	(27)	27
Dysthymic disorder & depression	15	15
Anxiety disorder	5	5
Personality disorder	2	2
Organic affective disorder	5	5
Neurological	(59)	59
Cerebro Vascular Accident	9	9
Multi Infarct Dementia	11	11
Alzheimer's Disease	15	15
Dementia other	12	12
Epilepsy	9	9
Head-trauma	3	3
Various a.o.		
Multiple Sclerosis, Polypharmacy	8	8

The population involves both neurological and psychiatric patients in whom the cognitive complaints are of central importance. There is a relative lack of health care institutions where these patients can go for diagnosis, treatment or care. Within this population there are sometimes treatable cases, either biological or nonbiological, yet there is still a large group of patients for whom there is no specific treatment or care program. This is a very unsatisfactory situation. The important implications for health care have to do with the fact that memory and other cognitive impairments can be a great handicap in daily life. It is for these reasons that this experimental intervention program has been designed.

Function-Orientated Rehabilitation Program: Premises

There are major differences in the intervention strategies presently used in the area of cognitive rehabilitation. Many current accounts of remediation lack a theoretical basis or a description of underlying paradigm and conceptual framework. This makes it hard to understand the rationale for the therapeutic strategy and to compare the results of these interventions

(Diller, 1987). It is therefore important to state the premises and underlying framework especially when a new intervention program is started.

The rehabilitation program that is described in the present paper is based on four premises:

Premise 1. Thorough neuropsychological and neuropsychiatric assessment as an essential starting point. For cognitive rehabilitation, it is necessary to have a clear and accurate cognitive profile, as both the treatment techniques and responses to treatment will be influenced by this profile. Table 2 summarizes the most relevant tests used in our clinic for the assessment of cognitive functions. These tests are based on behavioral neurology, information processing and psychometric tasks (see Luria, 1966, 1973; Lezak, 1983; Jolles, 1985).

Psychological functions such as memory are not unitary, as different aspects can be differentiated; for instance, the short-term span, consolidation, retrieval, learning capacity and the speed of memory search. In addition, modality- and material-specific aspects of memory can be discerned from a-specific aspects. Memory-related processes (such as arousal, attention, activation) are also relevant (Jolles & Hijman, 1983). The same is true for a broad concept such as 'behavioral planning' (Luria, 1966, 1973).

Premise 2. Use of a theoretical framework based on a brain-behavior paradigm. The work is largely based on the brain-behavior paradigm of Luria (1966, 1973).

Premise 3. Relating cognitive deficits to underlying brain structure and function. Nature and severity of the cognitive deficits are differentiated and, if possible, related to particular brain structures and function. For intervention programs it is important to know whether the relevant brain structures are intact and can be used or not.

Premise 4. Obtaining (semi)-Quantitative data. It is important to start rehabilitation programs in a systematic, protocolized way, because it will make evaluation of outcome more easy. Scales that have been developed so far are: 1. An observation-scale for appearance and behavior; 2. An observation-scale for psychological functions; 3. An observation-scale for performance during testing; 4. A semi-structured interview for evaluation; 5. A checklist for the translation of test results into daily life functioning; 6. A standard form to register test data.

Table 2
Tests Used for the Assessment of Cognitive Functioning

Area tested	Tests
Simple, complex motor	Luria-Christensen(D)[1]
Higher perception	Luria-Christensen(G)[1]; Raven Progressive Matrices[2]; Kaufman: Gestalt Closure[3]
Visuo construction	Luria-Christensen(C)[1]; WAIS block design[2]; Drawings; free and copying[2]; Complex Figure Test (Rey-Osterreith)[2]
Memory consolidation	Groninger Auditory Verbal Learning Test: delayed recognition[4]
Memory retrieval	Gron.A.V.Learning Test & Complex Fig.Test(Rey); delayed recall[2,4]; WAIS: information[2]
Learning capacity	Gron.A.V.Learning Test; learning curve[4]
Aud. short term span	Digit Span (WAIS)[2]
Visual short term span	Corsi Block tapping[2]
Language	Luria-Christensen(H) and (J)[1]; Verbal Fluency, Writing and Spelling[2]; WAIS: similarities; comprehension; vocabulary[2]
Behavioral, cognitive planning	Trial Making Test[2]; Stroop Colour Word Test III; Symbol Digit Modalities Test (spoken, written)[2]; Wisconsin Card Sorting Test (Milner)[2]; Gron.A.V.Learning Test; Learning strategies[4]
Speed of information	Trial Making Test[2,5]; Stroop Colour Word Test[2]; Symbol Digit Modalities Test[2]; Memory Comparison Task (Sternberg)[6]

Notes:

1. Luria's Neuropsychological Investigation. Adapted by Christensen (1979).
2. For more extensive explanations, see Lezak (1983).
3. Kaufman Test Battery for Children: Gestalt Closure (Kaufman & Kaufman, 1983).
4. Groninger Auditory Verbal Learning Test. An adapted Dutch version of the Rey Auditory Verbal Learning Test by Kalverboer & Deelman (Deelman, 1972).
5. Trial Making Test. Adapted by Vink & Jolles (1985).
6. Memory Comparison Task. Modified version of Sternberg's Additive factor model (Sternberg, 1975; Brand & Jolles, 1985).

Starting from these premises, a short intervention model with different topics was selected.

Function-Orientated Rehabilitation Program: Schedule

The structured program consists of five topics, which are planned in five different sessions. It is a short program, because of the population involved, namely, outpatients with mild cognitive disturbances. The program is primarily directed at the patient, but family or other significant persons are welcome to participate.

Session 1: *Assessment.* (see paragraph Function-Orientated Rehabilitation Program: Premises)

Session 2: *Informing about test results.* Neuropsychological findings with regard to the different functional categories are discussed and these findings are 'translated' in terms of daily life functioning: work, household activities, hobbies, sport, etc. When the subject recognizes the 'translation', this is recorded on a checklist. In this way, more systematic knowledge is obtained about the relationship between test performance and daily life functioning. This relation is often a topic of debate (Wilson, 1987a).

Session 3. *Education.* Teaching about the way the memory works and about memory related factors. The rationale is that information and knowledge about the disease or dysfunction can help reduce anxiety and change unrealistic or negative beliefs (Lazarus, 1980; Meichenbaum, 1981). Furthermore, people get a more realistic idea about a broad concept such as memory. Giving information about memory to memory disturbed patients is quite new. The first report has probably been by Laatsch (1983; cited by Grimm & Bleiberg, 1986).

Session 4. *Practical advice.* In this session attention is given to the way in which the subject copes with the cognitive deficits and how this can be improved. The advice given can be general, as would be given to all brain-injured persons. Examples have to do with the stabilization of stimuli from the environment, making it as familiar as possible, the communication in concrete, short sentences etc. On the other hand, specific advice are given, that are dependent on the cognitive profile or the specific problems of a particular patient. For example, if somebody has difficulty in cooking a meal, it is necessary to find out what aspects of the cooking behavior and its planning are defective and how this can be overcome. Is it possible to bypass some aspects in the linear sequence of acts or should another coping

strategy be recommended to use? Mnemonic strategies are advised and trained to enhance memory performance (see Harris, 1978; Wilson, 1987a).

Session 5. *Evaluation*. The last session is reserved for evaluation. Evaluation of the effect of the treatment is very difficult because it is so complex. Generally, the literature on the measurement of treatment effects does not give clear answers with respect to the evaluation procedure (Shallic, 1979; Gianutsos, 1980; Kazdin, 1982; Bakker, 1984; Brooks, Deelman & Zomeren van, 1984; Wilson, 1987b). For that reason, a semi-structured interview has been made in the present study in order to help evaluate the effect of the intervention. In this interview, 16 questions are raised about the feeling of general well-being, the impact of memory disturbances and other cognitive disturbances on daily life functioning and coping abilities, etc. The interview is taken before and 4-6 weeks after the intervention. Answers are judged on a 5-point scale. The five major questions have to do with: the presence of memory complaints; the impact of these complaints on daily life; the ability to cope with these complaints; the ability to recognize the particular nature of the complaints; a feeling of helplessness with respect to the cognitive complaints.

A case study

The need for a neuropsychological rehabilitation program came to light through a case study described by Jolles & Hijman (1984) in which the importance of directing attention to (mal)adaptive coping abilities and the situation at home was stressed.

The program in the present paper started with a case study of an elderly male patient.

Table 3
Characteristics Of Patient RA

Age	:	65
Profession	:	manager
Marital status	:	married
Educational level	:	university
Diagnosis	:	2 C.V.A. (one infarction right hemisphere (parieto- occipital) + one haemorhagic infarction in the left frontal region.
Residual problem	:	(4 months after revalidation program): Behavioral; adynamia, a lessened ability to plan and structure his life, suspiciousness, impulsivity, irresoluteness and aggressivity,: Emotional: depressed, problems with accepting the changed situation and coping with it, lessened confidence.

The patient (RA) was referred to the memory clinic for an extensive neuropsychological investigation because of cognitive and behavioral problems after C.V.A. The question was whether these problems had to do with the C.V.A. and if so, whether these would hamper the resumption of his work. The patient wanted to resume his work, but family and colleagues doubted whether this would be possible. They observed his rather severe cognitive disabilities, that were denied or minimized by RA himself. A second question was whether a training/treatment program directed at the deficits could be designed. The neuropsychological assessment was made as described in Function-Orientated Rehabilitation Program: Premises and Table 2. The results are shown in Table 4.

Table 4
Neuropsychological Test Results of Patient RA

Test	Result or Score
Luria D+E (motor functions)	intact
Luria G (higher visual functions)	intact
Luria H.J. (impressive + expr. speech)	defective
Fluency	4 words (letter-m-4 letters)*
Rey's Aud. Verbal Learning Test	
Recall trial 1-2-3-4-5	3-5-5-6-8*
Total 5 trials	27(+9 mistakes+3 double R.)**
Recognition Trial; Delayed Recall	13; 5 (+1 mistake)*
Digit span auditory	5
Stroop-Colour Word Test	
Card reading, colour naming	65 sec*, 83 sec*
response inhibition	188 sec (1 mistake+1 correction)**
Trial Making Test	
figures, concept shifting	82 sec*, 280 sec (+4 mistakes)**
Block Design	intact
Luria,C.F.T.(Rey): Drawing to copy	intact
Luria,C.F.T.(Rey): Drawing from memory	defective
Road Map Test (R-L discrimination)	104 sec (1 mistake)
WAIS: comprehension similarities	defective

Note:
* defective performance.
** very defective performance.

Dysfunctions are particularly present with respect to retrieval of material from memory, learning capacity and cognitive planning. The patient's evaluation of his own behavior/performance proved to be disturbed. The patient overestimated his own capacities. This could explain the discrepancy that he and others experienced with regard to the question of resuming work. These observations were made about one year after his release from the rehabilitation center. The patient and his spouse were informed about the findings and the test results were translated in terms of daily life functioning. The origin of the cognitive deficits was explained to them. Our hypothesis was that information and knowledge about the cognitive deficits would help the patient to function better in daily life. The hypothesis did not turn out to be true. Concrete examples, practical advice, intensive guidance and practice were necessary to help him and his wife understand the implications of brain damage and change their behavior. Practical advice was directed towards concrete situations. For example: it annoyed the wife that her husband did nothing and just sat in his chair, whereas he had always been an active man. It was explained that passivity and an inability to initiate behavior are symptoms of the disease. The patient could not help it, he was not unwilling but unable, and would remain passive if he was not helped. The wife could be of help by activating him in the right way, for example by helping him formulate plans of action, giving him concrete, short things to do, avoiding frequent concept shifting situations and by creating a situation of minimal distraction in order to help him focus on the relevant stimuli. It was also advised to allow him (extra) time to do a task in order to overcome his general slowness.

The complexity and inter-relation of problems after brain-injury are multiple and profound, even when some time has passed. In this case, the factor of "having accepted the change" appeared important. A "mourning" process was present which had to be worked through, otherwise a "function orientated approach" would be of no avail. There were many moments when neither the patient nor his wife picked up the relevant information. Both expected changes for the better, even miracles.

An Experimental Function-Oriented Guidance Program

Subjects and procedure

The experimental program described in the preceding paragraphs has been tested in a clinical experiment involving 10 patients. It was our aim to evaluate this experiment as a multiple single-case study and use both qualitative experience and semi-quantitative data to improve the program.

Table 5
Characteristics of Patients Subjected to Function Orientated Guidance

Sex	Education[1]	Age	Marital Status	Diagnosis
M	VII	65	married	CVA(2): right and left hemisph.
M	IV	41	divorced	Dysthymia
F	V	72	widow Transient	CVA right capsula interna; Global Amnesia
F	IV	47	married	Dysthymia
F	II	48	married	Dysthymia
F	IV	72	married	CVA right hemisphere
F	II	59	married	Contusional syndrome
M	IV	43	married	Dysthymia
M	IV	49	married	Cognitive complaints E.c.i.
M	IV	45	married	Solvent Agent Intoxication

Note: Education is rated on a 7-point scale, ranging from 1 (none or only some classes of primary school) to 7 (university).

The 10 patients were different as to diagnosis, etio-pathogenesis and profile of cognitive disturbances. The patient characteristics are given in Table 5, directly followed by their cognitive deficits (Table 6).

Most patients had problems in cognitive planning and memory retrieval. A reduction in the speed of information processing and a diminished learning capacity were secondary findings. Some patients had inacute hearing, which of course is of relevance, as auditory perception is one of the first steps in adequate information processing.

Table 6
Cognitive Deficits of 10 Patients who Participated in F.O.G.

Function	Prevalence of Cognitive Deficits
Memory	
Retrieval	9/10
Learning capacity	6/10
Consolidation	3/10
Immediate Span (auditory)	2/10
Immediate Span (visual)	2/9*
Memory Related Factors	
Planning	9/10
Speed of information processing	6/10
Auditory perception	4/10
Concentration	3/10

* Corsi Block span is missing for one patient.

Results

Since the experiment was designed as an open study without a control group or statistical analysis, only major tendencies and preliminary conclusions can be made. The program was generally judged as worthwhile, useful and interesting. A comparison of the answers on the semi-structured interview (before and 6-weeks after) showed that patients generally did not feel better after treatment, with a few exceptions. On the other hand, all subjects said that they could handle better the daily problems concerning memory. This in itself gave them more satisfaction and it reduced the feelings of anxiety and inadequacy as well as interactional problems. The same became apparent with respect to memory related factors. Subjects were always asked to give examples of their coping strategies and these often turned out to be more adequate. Sometimes they could handle a specific target behavior better. Sometimes the coping strategies were more general, such as better planning. Not all problems could be resolved, mostly

because they were not primarily neuropsychological, but more psychological in nature: stressful life-events (death of a spouse, loss of work), psychiatric problems (depression, longstanding neurotic symptoms) or an unresolved mourning process. Still, it became apparent that help was often possible with regard to relieving secondary problems such as a negative view of the consequences of their disability or anxiety (fear of dementia or other diseases). A second finding was that it was possible to do a systematic translation of the test results in terms of daily life functioning. About 80% of the examples given in the checklist were recognized by the subjects.

Discussion

The premises and methodological framework of a "Function-Oriented Guidance Program" for memory-disturbed patients have been introduced. The aim of the program is to teach cognitively disturbed people to use coping-skills more efficiently. The evaluation of the open pilot study described here has used single case methodology. It is a known fact that the methodology involved in treatment evaluation is generally judged as being very difficult (e.g. Miller, 1984) and, according to many researchers, the single-case experimental designs are a powerful answer to the problem of evaluation of effect (Kazdin, 1982; Wilson, 1987b).

The program has been carried out in 10 single-case studies. The first findings indicate a beneficial effect in terms of coping with memory deficits which – in themselves – have not changed over the treatment period. In other words, the memory deficits were still present but were perceived in another way and handled more efficiently. Not all participants have benefited, and it is not completely clear to which factors this can be attributed. It is therefore of importance to analyze whether particular diagnostic or psychosocial factors influence the outcome. One positive finding in this respect is the fact that for participation in a "Function Oriented Guidance Program", the co-existence of psychiatric disorders or recent stressful life events appears to be a contraindication. These factors have made it necessary to orient towards a more psychotherapeutic counselling procedure. In addition, it appeared important to know beforehand about: – nature and severity of cognitive disturbances (in case of severe disturbances it is advisable that family members participate in the intervention); – impact on daily life functioning; insight and motivation (some fail to appreciate the extent of their cognitive deficits); underlying disorder (course, prognosis); level of intellecutal functioning and insight (a verbal IQ of 90 or more is necessary).

The findings described in the present paper have prompted a number of changes in the model and in the methods that had been used until now. First, the selection of subjects: more attention will be given to selection of subjects in order to be able to predict those subjects who would best benefit from a F.O.G. Secondly, measurement of change: the evaluation material will be improved by use of: a revised interview for subjective evaluation (20 semi-structured questions, rated before and afterwards on a 5-point scale by two independent investigators); by a memory assessment questionnaire for both the patient and significant others; by objective tests with ecological validity such as described by Wilson (1987a) and other tests that are accepted as valid measures of the cognitive impairments; and also by social data (such as returning to work, number of visits to medical practitioners, changes in hobby and activity). Thirdly, therapeutic procedures: techniques will be specified in search for those that might be of possible value in amelioration; there are quite a number of possible sources of inspiration. So far the techniques used have been combinations of cognitive and behavioral techniques without a clear criterion. They are a choice of the individual trainer directed at specific problems of a particular patient, and the results could thus be partly due to the trainer.

The translation of test results into daily life situations is also a topic which needs further investigation. There is not yet a standard fashion in which this is done, nor any consensus of what a particular test measures and how this relates to daily life. Training memory-disturbed patients and teaching them about memory is sometimes a problem in itself. Therefore, in the next intervention study additional information about memory will be given in a booklet, so that the patient has a hard copy of the information that he or she has received. Afterwards, they will be examined on the knowledge and problem-solving abilities that have been acquired.

All knowledge gathered from this study is systematised and will be used in a follow-up study. The experimental design will be a cross-over design, in which the effects of Function Training (Gianutsos & Gianutsos, 1979) versus Function Oriented Guidance will be investigated.

In conclusion, this experimental intervention gives some encouraging indications that the treatment programme might be useful for patients with mild cognitive deficits. Although the results are not yet straight forward in a quantitative sense, the findings do add to our knowledge on the selection of methods, procedures and paradigms needed for the rehabilitation of this important group of patients who are presently without any substantial help, and who are very often quite handicapped by their cognitive deficits.

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